Analytical Laboratory

13339 Hagers Ferry Road
Huntersville, NC 28078-7929
McGuire Nuclear Complex - MG03A2
Phone: 980-875-5245 Fax: 980-875-4349

Order Summary Report

Order Number: **J12120342**

Project Name: Flex Fuel WW

Customer Name(s): Bill Kennedy, Melonie Martin, Wayne Chapman, Tom Johnson

Customer Address: 3195 Pine Hall Rd
Mailcode: Belews Steam Station
Belews Creek, NC 28012

Lab Contact: Jason C Perkins Phone: 980-875-5348

Report Authorized By: (Signature) Digitally signed by jay perkins DN: cn=jay perkins, o=Analytical Lab, ou, email=jay.perkins@duke-energy.com, c=US Date: 2013.01.18 15:14:23 -05'00' **Date:** 1/17/2013

Program Comments:

Please contact the Program Manager (Jason C Perkins) with any questions regarding this report.

Data Flags & Calculations:

Any analytical tests or individual analytes within a test flagged with a Qualifier indicate a deviation from the method quality system or quality control requirement. The qualifier description is found at the end of the Certificate of Analysis (sample results) under the qualifiers heading. All results are reported on a dry weight basis unless otherwise noted. Subcontracted data included on the Duke Certificate of Analysis is to be used as information only. Certified vendor results can be found in the subcontracted lab final report. Duke Energy Analytical Laboratory subcontracts analyses to other vendor laboratories that have been qualified by Duke Energy to perform these analyses except where noted.

Data Package:

This data package includes analytical results that are applicable only to the samples described in this narrative. An estimation of the uncertainty of measurement for the results in the report is available upon request. This report shall not be reproduced, except in full, without the written consent of the Analytical Laboratory. Please contact the Analytical laboratory with any questions. The order of individual sections within this report is as follows:

Job Summary Report, Sample Identification, Technical Validation of Data Package, Analytical Laboratory Certificate of Analysis, Analytical Laboratory QC Reports, Sub-contracted Laboratory Results, Customer Specific Data Sheets, Reports & Documentation, Customer Database Entries, Test Case Narratives, Chain of Custody (COC)

Certification:

The Analytical Laboratory holds the following State Certifications : North Carolina (DENR) Certificate #248, South Carolina (DHEC) Laboratory ID # 99005. Contact the Analytical Laboratory for definitive information about the certification status of specific methods.

Sample ID's & Descriptions:

Sample ID	Plant/Station	Collection Date and Time	Collected By	Sample Description
2012027306	BELEWS	21-Dec-12 7:30 AM	L. TURNER	FGD Purge Eff
2012027307	BELEWS	21-Dec-12 7:35 AM	L. TURNER	EQ TANK
2012027308	BELEWS	21-Dec-12 7:40 AM	L. TURNER	BIOREACTOR 1 INF
2012027309	BELEWS	21-Dec-12 7:40 AM	L. TURNER	biOREACTOR 1 INF HG BLK
2012027310	BELEWS	21-Dec-12 7:45 AM	L. TURNER	BIOREACTOR 2 INF.
2012027311	BELEWS	21-Dec-12 7:45 AM	L. TURNER	BIOREACTOR 2 INF. HG BLANK
2012027312	BELEWS	21-Dec-12 7:50 AM	L. TURNER	BIOREACTOR 2 EFF.
2012027313	BELEWS	21-Dec-12 7:50 AM	L. TURNER	BIOREACTOR 2 EFF. HG BLANK
2012027314	BELEWS	21-Dec-12 8:00 AM	L. TURNER	FILTER BLANK

9 Total Samples

Technical Validation Review

Checklist:

COC and .pdf report are in agreement with sample totals and analyses (compliance programs and procedures).	☑ Yes	☐ No
All Results are less than the laboratory reporting limits.	☐ Yes	☑ No
All laboratory QA/QC requirements are acceptable.	☑ Yes	☐ No

The following vendor labs are pending 2013 qualification: Applied Speciation
Brooks Rand Lab

Report Sections Included:

- ☑ Job Summary Report
- ☑ Sample Identification
- ☑ Technical Validation of Data Package
- ☑ Analytical Laboratory Certificate of Analysis
- ☐ Analytical Laboratory QC Report
- ☑ Sub-contracted Laboratory Results
- ☐ Customer Specific Data Sheets, Reports, & Documentation
- ☐ Customer Database Entries
- ☑ Chain of Custody
- ☑ Electronic Data Deliverable (EDD) Sent Separately

Reviewed By: DBA Account Date: 1/17/2013

Certificate of Laboratory Analysis

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Order # J12120342

Site: FGD Purge Eff
Collection Date: 21-Dec-12 7:30 AM

Sample #: 2012027306
Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Bromide	**100**	mg/L		5	50	EPA 300.0	01/02/2013 17:46	BGN9034
Chloride	**7300**	mg/L		100	1000	EPA 300.0	01/02/2013 17:46	BGN9034
Sulfate	**1200**	mg/L		100	1000	EPA 300.0	01/02/2013 17:46	BGN9034
MERCURY (COLD VAPOR) IN WATER								
Mercury (Hg)	**182**	ug/L		5	100	EPA 245.1	12/27/2012 08:41	AGIBBS
DISSOLVED METALS BY ICP								
Manganese (Mn)	**11.2**	mg/L		0.05	10	EPA 200.7	01/08/2013 14:11	MHH7131
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**233**	mg/L		0.5	10	EPA 200.7	01/10/2013 12:03	MHH7131
Calcium (Ca)	**4930**	mg/L		0.1	10	EPA 200.7	01/10/2013 12:03	MHH7131
Iron (Fe)	**191**	mg/L		0.1	10	EPA 200.7	01/10/2013 12:03	MHH7131
Magnesium (Mg)	**1080**	mg/L		0.05	10	EPA 200.7	01/10/2013 12:03	MHH7131
Manganese (Mn)	**12.7**	mg/L		0.05	10	EPA 200.7	01/10/2013 12:03	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**173**	ug/L		10	10	EPA 200.8	01/10/2013 14:22	KRICHAR
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**429**	ug/L		10	10	EPA 200.8	01/10/2013 12:32	KRICHAR
Cadmium (Cd)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:32	KRICHAR
Chromium (Cr)	**372**	ug/L		10	10	EPA 200.8	01/10/2013 12:32	KRICHAR
Copper (Cu)	**217**	ug/L		10	10	EPA 200.8	01/10/2013 12:32	KRICHAR
Nickel (Ni)	**359**	ug/L		10	10	EPA 200.8	01/10/2013 12:32	KRICHAR
Selenium (Se)	**3890**	ug/L		10	10	EPA 200.8	01/10/2013 12:32	KRICHAR
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:32	KRICHAR
Zinc (Zn)	**496**	ug/L		10	10	EPA 200.8	01/10/2013 12:32	KRICHAR
SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_AS&C
TOTAL DISSOLVED SOLIDS								
TDS	**20000**	mg/L		200	1	SM2540C	01/02/2013 11:45	SWILLI3
TOTAL SUSPENDED SOLIDS								
TSS	**1400**	mg/L		250	1	SM2540D	12/31/2012 09:41	SWILLI3

Certificate of Laboratory Analysis

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Order # J12120342

Site: EQ TANK **Sample #: 2012027307**

Collection Date: 21-Dec-12 7:35 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
MERCURY (COLD VAPOR) IN WATER								
Mercury (Hg)	**27.4**	ug/L		2.5	50	EPA 245.1	12/27/2012 08:44	AGIBBS
DISSOLVED METALS BY ICP								
Manganese (Mn)	**9.68**	mg/L		0.05	10	EPA 200.7	01/08/2013 14:15	MHH7131
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**227**	mg/L		0.5	10	EPA 200.7	01/10/2013 12:07	MHH7131
Calcium (Ca)	**3400**	mg/L		0.1	10	EPA 200.7	01/10/2013 12:07	MHH7131
Iron (Fe)	**35.1**	mg/L		0.1	10	EPA 200.7	01/10/2013 12:07	MHH7131
Magnesium (Mg)	**995**	mg/L		0.05	10	EPA 200.7	01/10/2013 12:07	MHH7131
Manganese (Mn)	**10.4**	mg/L		0.05	10	EPA 200.7	01/10/2013 12:07	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**107**	ug/L		10	10	EPA 200.8	01/10/2013 14:26	KRICHAR
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**82.5**	ug/L		10	10	EPA 200.8	01/10/2013 12:35	KRICHAR
Cadmium (Cd)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:35	KRICHAR
Chromium (Cr)	**61.5**	ug/L		10	10	EPA 200.8	01/10/2013 12:35	KRICHAR
Copper (Cu)	**37.7**	ug/L		10	10	EPA 200.8	01/10/2013 12:35	KRICHAR
Nickel (Ni)	**175**	ug/L		10	10	EPA 200.8	01/10/2013 12:35	KRICHAR
Selenium (Se)	**821**	ug/L		10	10	EPA 200.8	01/10/2013 12:35	KRICHAR
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:35	KRICHAR
Zinc (Zn)	**110**	ug/L		10	10	EPA 200.8	01/10/2013 12:35	KRICHAR

Site: BIOREACTOR 1 INF **Sample #: 2012027308**

Collection Date: 21-Dec-12 7:40 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
MERCURY 1631 - (Analysis Performed by Brooks Rand Labs LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_BRAND
DISSOLVED METALS BY ICP								
Manganese (Mn)	**2.19**	mg/L		0.05	10	EPA 200.7	01/08/2013 14:19	MHH7131
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**209**	mg/L		0.5	10	EPA 200.7	01/10/2013 12:11	MHH7131
Calcium (Ca)	**3270**	mg/L		0.1	10	EPA 200.7	01/10/2013 12:11	MHH7131
Iron (Fe)	**< 0.1**	mg/L		0.1	10	EPA 200.7	01/10/2013 12:11	MHH7131
Magnesium (Mg)	**929**	mg/L		0.05	10	EPA 200.7	01/10/2013 12:11	MHH7131
Manganese (Mn)	**2.35**	mg/L		0.05	10	EPA 200.7	01/10/2013 12:11	MHH7131

Certificate of Laboratory Analysis

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Order # J12120342

Site: BIOREACTOR 1 INF **Sample #: 2012027308**

Collection Date: 21-Dec-12 7:40 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**120**	ug/L		10	10	EPA 200.8	01/10/2013 14:29	KRICHAR
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:38	KRICHAR
Cadmium (Cd)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:38	KRICHAR
Chromium (Cr)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:38	KRICHAR
Copper (Cu)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:38	KRICHAR
Nickel (Ni)	**23.0**	ug/L		10	10	EPA 200.8	01/10/2013 12:38	KRICHAR
Selenium (Se)	**97.8**	ug/L		10	10	EPA 200.8	01/10/2013 12:38	KRICHAR
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:38	KRICHAR
Zinc (Zn)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:38	KRICHAR
SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_AS&C

Site: biOREACTOR 1 INF HG BLK **Sample #: 2012027309**

Collection Date: 21-Dec-12 7:40 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
MERCURY 1631 - (Analysis Performed by Brooks Rand Labs LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_BRAND

Site: BIOREACTOR 2 INF. **Sample #: 2012027310**

Collection Date: 21-Dec-12 7:45 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
MERCURY 1631 - (Analysis Performed by Brooks Rand Labs LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_BRAND
DISSOLVED METALS BY ICP								
Manganese (Mn)	**1.61**	mg/L		0.05	10	EPA 200.7	01/08/2013 14:23	MHH7131
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**203**	mg/L		0.5	10	EPA 200.7	01/10/2013 12:15	MHH7131
Calcium (Ca)	**3250**	mg/L		0.1	10	EPA 200.7	01/10/2013 12:15	MHH7131
Iron (Fe)	**0.223**	mg/L		0.1	10	EPA 200.7	01/10/2013 12:15	MHH7131
Magnesium (Mg)	**926**	mg/L		0.05	10	EPA 200.7	01/10/2013 12:15	MHH7131
Manganese (Mn)	**1.68**	mg/L		0.05	10	EPA 200.7	01/10/2013 12:15	MHH7131

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Order # J12120342

Site: BIOREACTOR 2 INF. **Sample #: 2012027310**

Collection Date: 21-Dec-12 7:45 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**20.0**	ug/L		10	10	EPA 200.8	01/10/2013 14:33	KRICHAR
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:42	KRICHAR
Cadmium (Cd)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:42	KRICHAR
Chromium (Cr)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:42	KRICHAR
Copper (Cu)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:42	KRICHAR
Nickel (Ni)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:42	KRICHAR
Selenium (Se)	**20.1**	ug/L		10	10	EPA 200.8	01/10/2013 12:42	KRICHAR
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:42	KRICHAR
Zinc (Zn)	**< 10**	ug/L		10	10	EPA 200.8	01/10/2013 12:42	KRICHAR
SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_AS&C

Site: BIOREACTOR 2 INF. HG BLANK **Sample #: 2012027311**

Collection Date: 21-Dec-12 7:45 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
MERCURY 1631 - (Analysis Performed by Brooks Rand Labs LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_BRAND

Site: BIOREACTOR 2 EFF. **Sample #: 2012027312**

Collection Date: 21-Dec-12 7:50 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Bromide	**90**	mg/L		5	50	EPA 300.0	01/02/2013 18:05	BGN9034
Chloride	**6600**	mg/L		100	1000	EPA 300.0	01/02/2013 18:05	BGN9034
Sulfate	**1400**	mg/L		100	1000	EPA 300.0	01/02/2013 18:05	BGN9034
MERCURY 1631 - (Analysis Performed by Brooks Rand Labs LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_BRAND
DISSOLVED METALS BY ICP								
Manganese (Mn)	**1.39**	mg/L		0.05	10	EPA 200.7	01/08/2013 14:27	MHH7131

Certificate of Laboratory Analysis

Order # J12120342

Site: BIOREACTOR 2 EFF. **Sample #: 2012027312**

Collection Date: 21-Dec-12 7:50 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**205**	mg/L		0.5	10	EPA 200.7	01/10/2013 12:19	MHH7131
Calcium (Ca)	**3040**	mg/L		0.1	10	EPA 200.7	01/10/2013 12:19	MHH7131
Iron (Fe)	**< 0.1**	mg/L		0.1	10	EPA 200.7	01/10/2013 12:19	MHH7131
Magnesium (Mg)	**889**	mg/L		0.05	10	EPA 200.7	01/10/2013 12:19	MHH7131
Manganese (Mn)	**1.43**	mg/L		0.05	10	EPA 200.7	01/10/2013 12:19	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**9.24**	ug/L		5	5	EPA 200.8	01/10/2013 14:36	KRICHAR
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 5**	ug/L		5	5	EPA 200.8	01/10/2013 12:45	KRICHAR
Cadmium (Cd)	**< 5**	ug/L		5	5	EPA 200.8	01/10/2013 12:45	KRICHAR
Chromium (Cr)	**< 5**	ug/L		5	5	EPA 200.8	01/10/2013 12:45	KRICHAR
Copper (Cu)	**< 5**	ug/L		5	5	EPA 200.8	01/10/2013 12:45	KRICHAR
Nickel (Ni)	**< 5**	ug/L		5	5	EPA 200.8	01/10/2013 12:45	KRICHAR
Selenium (Se)	**10.3**	ug/L		5	5	EPA 200.8	01/10/2013 12:45	KRICHAR
Silver (Ag)	**< 5**	ug/L		5	5	EPA 200.8	01/10/2013 12:45	KRICHAR
Zinc (Zn)	**< 5**	ug/L		5	5	EPA 200.8	01/10/2013 12:45	KRICHAR
SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_AS&C

Site: BIOREACTOR 2 EFF. HG BLANK **Sample #: 2012027313**

Collection Date: 21-Dec-12 7:50 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
MERCURY 1631 - (Analysis Performed by Brooks Rand Labs LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_BRAND

Site: FILTER BLANK **Sample #: 2012027314**

Collection Date: 21-Dec-12 8:00 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
DISSOLVED METALS BY ICP								
Manganese (Mn)	**0.034**	mg/L		0.005	1	EPA 200.7	01/08/2013 14:03	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**< 1**	ug/L		1	1	EPA 200.8	01/10/2013 13:52	KRICHAR

January 14, 2013

Duke Energy
ATTN: Jay Perkins
Scientific Support-Laboratory
13339 Hagers Ferry Road
Huntersville NC 28078
jcperkins@duke-energy.com
labcustomer@duke-energy.com

RE: Project DUK-HV1201 Client Project: J12120342

Dear Mr. Perkins,

On December 28, 2012, Brooks Rand Labs (BRL) received three (3) wastewater samples and three (3) associated field blanks. An aliquot was removed from each sample bottle and filtered into a separate container designed for dissolved mercury (Hg) analysis. The sample volume from the original container was logged-in for total Hg analysis. All samples were received, prepared, analyzed, and stored according to BRL SOPs and EPA methodology.

Data used for regulatory purposes has a 24 hour filtration holding time requirement. Non-regulatory purposed data has a 48 hour filtration holding time. The samples were received outside of the 48 hour filtration requirement and the results were qualified **H**.

The results were blank-corrected as described in the calculations section of the relevant SOP and may have been evaluated using reporting limits that have been adjusted to account for sample aliquot size. Please refer to the *Sample Results* page for sample-specific MDLs, MRLs, and other details. Aside from concentration qualifiers, all data was reported without further qualification and all associated quality control sample results met the acceptance criteria.

BRL, an accredited laboratory, certifies the reported results of all analyses for which BRL is NELAP accredited meet all NELAP requirements. For more details, see the *Report Information* page of the report.

Please feel free to contact us if you have any questions regarding this report.

Sincerely,

Lydia Greaves
Project Manager
lydia@brooksrand.com

Mi Sun Um
Data Manager
misun@brooksrand.com

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Report Information

Laboratory Accreditation

BRL is accredited by the *National Environmental Laboratory Accreditation Program* (NELAP) through the State of Florida Department of Health, Bureau of Laboratories (E87982) and is certified to perform many environmental analyses. BRL is also certified by many other states to perform environmental analyses. For a current list of our accreditations /certifications, please visit our website at <http://www.brooksrand.com/default.asp?contentID=586>. Results reported relate only to the samples listed in the report.

Field Quality Control Samples

Please be notified that certain EPA methods require the collection of field quality control samples of an appropriate type and frequency; failure to do so is considered a deviation from some methods and for compliance purposes should only be done with the approval of regulatory authorities. Please see the specific EPA methods for details regarding required field quality control samples.

Common Abbreviations

BLK	method blank	**MS**	matrix spike
BRL	Brooks Rand Labs	**MSD**	matrix spike duplicate
BS	laboratory fortified blank	**ND**	non-detect
CAL	calibration standard	**NR**	non-reportable
CCV	continuing calibration verification	**PS**	post preparation spike
COC	chain of custody record	**REC**	percent recovery
CRM	certified reference material	**RPD**	relative percent difference
D	dissolved fraction	**RSD**	relative standard deviation
DUP	duplicate	**SCV**	secondary calibration verification
ICV	initial calibration verification	**SOP**	standard operating procedure
MDL	method detection limit	**SRM**	standard reference material
MRL	method reporting limit	**T**	total recoverable fraction

Definition of Data Qualifiers

(Effective 9/23/09)

B Detected by the instrument, the result is > the MDL but ≤ the MRL. Result is reported and considered an estimate.
E An estimated value due to the presence of interferences. A full explanation is presented in the narrative.
H Holding time and/or preservation requirements not met. Result is estimated.
J Estimated value. A full explanation is presented in the narrative.
J-M Duplicate precision (RPD) for associated QC sample was not within acceptance criteria. Result is estimated.
J-N Spike recovery for associated QC sample was not within acceptance criteria. Result is estimated.
M Duplicate precision (RPD) was not within acceptance criteria. Result is estimated.
N Spike recovery was not within acceptance criteria. Result is estimated.
R Rejected, unusable value. A full explanation is presented in the narrative.
U Result is ≤ the MDL or client requested reporting limit (CRRL). Result reported as the MDL or CRRL.
X Result is not BLK-corrected and is within 10x the absolute value of the highest detectable BLK in the batch. Result is estimated.

These qualifiers are based on those previously utilized by Brooks Rand Labs, those found in the EPA SOW ILM03.0, Exhibit B, Section III, pg. B-18, and the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review; USEPA; January 2010. These supersede all previous qualifiers ever employed by BRL.

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Sample Information

Sample	Lab ID	Report Matrix	Type	Sampled	Received
BioReactor 1 Inf	1252012-01	Influent	Sample	12/21/2012	12/28/2012
BioReactor 1 Inf	1252012-02	Influent	Sample	12/21/2012	12/28/2012
BioReactor 1 Inf Hg Blk	1252012-03	DIW	Field Blank	12/21/2012	12/28/2012
BioReactor 1 Inf Hg Blk	1252012-04	DIW	Field Blank	12/21/2012	12/28/2012
BioReactor 2 Inf	1252012-05	Influent	Sample	12/21/2012	12/28/2012
BioReactor 2 Inf	1252012-06	Influent	Sample	12/21/2012	12/28/2012
BioReactor 2 Inf Hg Blk	1252012-07	DIW	Field Blank	12/21/2012	12/28/2012
BioReactor 2 Inf Hg Blk	1252012-08	DIW	Field Blank	12/21/2012	12/28/2012
BioReactor 2 Eff	1252012-09	Effluent	Sample	12/21/2012	12/28/2012
BioReactor 2 Eff	1252012-10	Effluent	Sample	12/21/2012	12/28/2012
BioReactor 2 Eff Hg Blk	1252012-11	DIW	Field Blank	12/21/2012	12/28/2012
BioReactor 2 Eff Hg Blk	1252012-12	DIW	Field Blank	12/21/2012	12/28/2012

Batch Summary

Analyte	Lab Matrix	Method	Prepared	Analyzed	Batch	Sequence
Hg	Water	EPA 1631	01/02/2013	01/03/2013	B122445	1300013

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Sample Results

Sample	Analyte	Report Matrix	Basis	Result	Qualifier	MDL	MRL	Unit	Batch	Sequence
BioReactor 1 Inf										
1252012-01	Hg	Influent	T	50.2		0.76	2.02	ng/L	B122445	1300013
1252012-02	Hg	Influent	D	44.2	H	0.76	2.02	ng/L	B122445	1300013
BioReactor 1 Inf Hg Blk										
1252012-03	Hg	DIW	T	0.15	U	0.15	0.39	ng/L	B122445	1300013
1252012-04	Hg	DIW	D	0.15	H, U	0.15	0.41	ng/L	B122445	1300013
BioReactor 2 Eff										
1252012-09	Hg	Effluent	T	3.71		0.15	0.39	ng/L	B122445	1300013
1252012-10	Hg	Effluent	D	0.55	H	0.15	0.39	ng/L	B122445	1300013
BioReactor 2 Eff Hg Blk										
1252012-11	Hg	DIW	T	0.15	U	0.15	0.41	ng/L	B122445	1300013
1252012-12	Hg	DIW	D	0.15	H, U	0.15	0.41	ng/L	B122445	1300013
BioReactor 2 Inf										
1252012-05	Hg	Influent	T	11.9		0.38	1.01	ng/L	B122445	1300013
1252012-06	Hg	Influent	D	1.08	H	0.15	0.39	ng/L	B122445	1300013
BioReactor 2 Inf Hg Blk										
1252012-07	Hg	DIW	T	0.15	U	0.15	0.39	ng/L	B122445	1300013
1252012-08	Hg	DIW	D	0.15	H, U	0.15	0.41	ng/L	B122445	1300013

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Accuracy & Precision Summary

Batch: B122445
Lab Matrix: Water
Method: EPA 1631

Sample	Analyte	Native	Spike	Result	Units	REC & Limits	RPD & Limits
B122445-SRM1	**Certified Reference Material (1249026, NIST 1641d 1000x dilution)**						
	Hg		15.68	15.97	ng/L	102% 85-115	
B122445-MS1	**Matrix Spike (1251009-01)**						
	Hg	ND	20.24	17.62	ng/L	86% 71-125	
B122445-MSD1	**Matrix Spike Duplicate (1251009-01)**						
	Hg	ND	20.45	15.53	ng/L	75% 71-125	13% 24
B122445-MS2	**Matrix Spike (1252010-01)**						
	Hg	79.93	505.1	554.7	ng/L	94% 71-125	
B122445-MSD2	**Matrix Spike Duplicate (1252010-01)**						
	Hg	79.93	505.1	574.7	ng/L	98% 71-125	4% 24

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Method Blanks & Reporting Limits

Batch: B122445
Matrix: Water
Method: EPA 1631
Analyte: Hg

Sample	Result	Units
B122445-BLK1	0.21	ng/L
B122445-BLK2	0.16	ng/L
B122445-BLK3	0.12	ng/L
B122445-BLK4	0.23	ng/L

Average: 0.18 **Standard Deviation:** 0.05 **MDL:** 0.15
Limit: 0.50 **Limit:** 0.10 **MRL:** 0.40

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Instrument Calibration

Sequence: 1300013
Instrument: THG-06(MerxT)
Date: 01/03/2013
Analyte: Hg

Total Mercury and Mercury Speciation by CVAFS
Method: EPA 1631

Lab ID	True Value	Result	Units	REC & Limits	
1300013-IBL1		2.86	pg of Hg		
1300013-IBL2		3.47	pg of Hg		
1300013-IBL3		4.89	pg of Hg		
1300013-IBL4		4.38	pg of Hg		
1300013-CAL1	10.00	10.72	pg of Hg	107%	
1300013-CAL2	25.00	25.50	pg of Hg	102%	
1300013-CAL3	100.0	100.7	pg of Hg	101%	
1300013-CAL4	500.0	470.1	pg of Hg	94%	
1300013-CAL5	2500	2569	pg of Hg	103%	
1300013-CAL6	10000	9465	pg of Hg	95%	
1300013-ICV1	1568	1597	pg of Hg	102%	85-115
1300013-CCB1		7.64	pg of Hg		
1300013-CCV1	500.0	490.7	pg of Hg	98%	77-123
1300013-CCB2		5.90	pg of Hg		
1300013-CCB3		5.14	pg of Hg		
1300013-CCB4		5.31	pg of Hg		
1300013-CCV2	500.0	495.5	pg of Hg	99%	77-123
1300013-CCB5		6.03	pg of Hg		
1300013-CCV3	500.0	491.4	pg of Hg	98%	77-123
1300013-CCB6		5.29	pg of Hg		
1300013-CCV4	500.0	481.9	pg of Hg	96%	77-123
1300013-CCB7		5.09	pg of Hg		
1300013-CCV5	500.0	478.2	pg of Hg	96%	77-123
1300013-CCB8		4.69	pg of Hg		
1300013-CCV6	500.0	474.5	pg of Hg	95%	77-123
1300013-CCB9		4.76	pg of Hg		
1300013-CCV7	500.0	469.6	pg of Hg	94%	77-123
1300013-CCBA		4.83	pg of Hg		
1300013-CCV8	500.0	467.6	pg of Hg	94%	77-123
1300013-CCBB		9.57	pg of Hg		
1300013-CCV9	500.0	469.9	pg of Hg	94%	77-123
1300013-CCBC		7.19	pg of Hg		
1300013-CCVA	500.0	467.9	pg of Hg	94%	77-123
1300013-CCBD		5.26	pg of Hg		
1300013-CCVB	500.0	466.9	pg of Hg	93%	77-123
1300013-CCBE		4.71	pg of Hg		
1300013-CCVC	500.0	481.6	pg of Hg	96%	77-123
1300013-CCBF		4.20	pg of Hg		
1300013-ICV2	1568	1515	pg of Hg	97%	85-115
1300013-CCVD	500.0	488.4	pg of Hg	98%	77-123

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Instrument Calibration

Sequence: 1300013
Instrument: THG-06(MerxT)
Date: 01/03/2013
Analyte: Hg

Total Mercury and Mercury Speciation by CVAFS
Method: EPA 1631

Lab ID	True Value	Result	Units	REC & Limits	
1300013-CCBG		4.25	pg of Hg		
1300013-CCVE	500.0	491.1	pg of Hg	98%	77-123
1300013-CCBH		4.31	pg of Hg		

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Sample Containers

Lab ID: 1252012-01
Sample: BioReactor 1 Inf
Report Matrix: Influent
Sample Type: Sample
Collected: 12/21/2012
Received: 12/28/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	500 mL	71666330 10	none	n/a		Cooler

Lab ID: 1252012-02
Sample: BioReactor 1 Inf
Report Matrix: Influent
Sample Type: Sample
Collected: 12/21/2012
Received: 12/28/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	250 mL	71691270 10	none	n/a		Cooler

Comments: Split from THg container

Lab ID: 1252012-03
Sample: BioReactor 1 Inf Hg Blk
Report Matrix: DIW
Sample Type: Field Blank
Collected: 12/21/2012
Received: 12/28/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	500 mL	71666330 10	none	n/a		Cooler

Lab ID: 1252012-04
Sample: BioReactor 1 Inf Hg Blk
Report Matrix: DIW
Sample Type: Field Blank
Collected: 12/21/2012
Received: 12/28/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	250 mL	71691270 10	none	n/a		Cooler

Comments: Split from THg container

Lab ID: 1252012-05
Sample: BioReactor 2 Inf
Report Matrix: Influent
Sample Type: Sample
Collected: 12/21/2012
Received: 12/28/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	500 mL	71666330 10	none	n/a		Cooler

Lab ID: 1252012-06
Sample: BioReactor 2 Inf
Report Matrix: Influent
Sample Type: Sample
Collected: 12/21/2012
Received: 12/28/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	250 mL	71691270 10	none	n/a		Cooler

Comments: Split from THg container

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Sample Containers

Lab ID: 1252012-07
Sample: BioReactor 2 Inf Hg Blk
Report Matrix: DIW
Sample Type: Field Blank
Collected: 12/21/2012
Received: 12/28/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	500 mL	71666330 10	none	n/a		Cooler

Lab ID: 1252012-08
Sample: BioReactor 2 Inf Hg Blk
Report Matrix: DIW
Sample Type: Field Blank
Collected: 12/21/2012
Received: 12/28/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	250 mL	71691270 10	none	n/a		Cooler

Comments: Split from THg container

Lab ID: 1252012-09
Sample: BioReactor 2 Eff
Report Matrix: Effluent
Sample Type: Sample
Collected: 12/21/2012
Received: 12/28/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	500 mL	71666330 10	none	n/a		Cooler

Lab ID: 1252012-10
Sample: BioReactor 2 Eff
Report Matrix: Effluent
Sample Type: Sample
Collected: 12/21/2012
Received: 12/28/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	250 mL	71691270 10	none	n/a		Cooler

Comments: Split from THg container

Lab ID: 1252012-11
Sample: BioReactor 2 Eff Hg Blk
Report Matrix: DIW
Sample Type: Field Blank
Collected: 12/21/2012
Received: 12/28/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	500 mL	71666330 10	none	n/a		Cooler

Lab ID: 1252012-12
Sample: BioReactor 2 Eff Hg Blk
Report Matrix: DIW
Sample Type: Field Blank
Collected: 12/21/2012
Received: 12/28/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	250 mL	71691270 10	none	n/a		Cooler

Comments: Split from THg container

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Shipping Containers

Cooler

Received: December 28, 2012 9:05
Tracking No: 535305197092 via FedEx
Coolant Type: Ice
Temperature: -0.4 °C

Description: Cooler
Damaged in transit? No
Returned to client? No

Custody seals present? No
Custody seals intact? No
COC present? Yes

1252012

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-4349

Analytical Laboratory Use Only

LIMS # J12120342 | Matrix: OTHER | Samples Originating From: NC ___ SC ___
Logged By: [illegible] | Date & Time: 12/27/12 0922 | SAMPLE PROGRAM: Ground Water ___ NPDES ___ Drinking Water ___ UST ___ RCRA ___ Waste ___
Cooler Temp (C): 0.3

[19]Page 1 of 1
DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Customer must Complete

[1]Project Name	Belews Creek (Flex Fuel) - WW		[2]Phone No:
[2] Client:	Melonie Martin, Wayne Chapman, Tom Johnson, Bill Kennedy		[4]Fax No:
[5]Project:	MBCFFLX01	[6]Account:	Mail Code:
[8]Oper. Unit:	BC01	[9]Process: NEXHSTK	[10]Activity ID:

AS&C - PO#133241 [redacted]

Brooks Rand
PO#141391

[15]Preserv.: 1=HCl, 2=H_2SO_4, 3=HNO_3, 4=Ice, 5=None

Complete all appropriate non-shaded areas.

LAB USE ONLY

Customer to complete appropriate columns to right

[11]Lab ID	Se Speciation Bottle ID	[13]Sample Description or ID	Date	Time	Signature	[17]Comp.	[18]Grab	[16]Analyses Required: TDS, TSS	Hg 1631 total and filtered V_Brand	Metals + Hg 245.1*	Mn (ICP), Se (IMS) filtered	Se, Speciation, V_ASC				Chloride, Sulfate, Bromide, - Dionex
								4	4	3	3	4				4
20120273 06		FGD Purge Eff	12-21	730	[signature]			1		1	1	1				1
20120273 07		EQ Tank		735						1	1					
20120273 08		BioReactor 1 Inf		740					1	1*	1	1				
20120273 09		BioReactor 1 Inf Hg Blk		740					1							
20120273 10		BioReactor 2 Inf		745					1	1*	1	1				
20120273 11		BioReactor 2 Inf Hg Blk		745					1							
20120273 12		BioReactor 2 Eff		750					1	1*	1	1				1
20120273 13		BioReactor 2 Eff Hg Blk		750					1							
20120273 14		Filter Blank		800							1					

Filter Mn and Se in the field

Lab, return kit to Tom Johnson [illegible] 12/27/12

Customer to sign & date below - fill out from left to right.

1) Relinquished By: [signature]	Date/Time: 12/26/12 1300	2) Accepted By: COURIER	Date/Time: 12/26/12
3) Relinquished By: COURIER	Date/Time: 12/27/12 0915	4) Accepted By: [signature]	Date/Time: 12/27/12 0915
5) Relinquished By:	Date/Time:	6) Accepted By:	Date/Time:
7) Relinquished By: [signature]	Date/Time: 12/27/12 1300	8) Accepted By:	Date/Time:
9) Seal/Locked By: [signature]	Date/Time: 12/27/12 1300	10) Seal/Lock Opened By: [signature]	Date/Time: 12/28/12 0905
11) Seal/Locked By:	Date/Time:	12) Seal/Lock Opened By:	Date/Time:

Comments

* Metals=TRM/IMS = As, Cd, Cr, Cu, Ni, Se, Ag, Zn TRM/ICP = B, Ca, Fe, Mg, Mn * No Hg 245.1

Customer, IMPORTANT! Please indicate desired turnaround.

[22]Requested Turnaround

21 Days ___X___
*7 Days ___
*48 Hr ___
*Vendor Lab 13 Days ___X___

1-10-13

APPLIED SPECIATION
AND CONSULTING, LLC

18804 Northcreek Parkway Bothell, WA, 98011
Tel: (425) 483-3300 Fax: (425) 483-9818
www.appliedspeciation.com

January 8, 2013

Jay Perkins
Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd.
Huntersville, NC 28078
(704) 875-5245

Project: Belews Creek (Flex Fuel) - WW (LIMS #J12120342)

Dear Mr. Perkins,

Attached is the report associated with four (4) aqueous samples submitted for selenium speciation on December 27, 2012. The samples were received in a sealed cooler at 0.0°C on December 28, 2012. Selenium speciation analysis was performed via ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS). Any issues associated with the analysis are addressed in the following report.

If you have any questions, please feel free to contact me at your convenience.

Sincerely,

Russell Gerads
Vice President
Applied Speciation and Consulting, LLC

Applied Speciation and Consulting, LLC

Report prepared for:

Jay Perkins
Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd.
Huntersville, NC 28078

Project: Belews Creek (Flex Fuel) - WW (LIMS #J12120342)

January 8, 2013

1. Sample Reception

Four (4) aqueous samples in 125mL HDPE bottles (provided by Applied Speciation and Consulting) were submitted for selenium speciation analysis on December 27, 2012. The samples were received on December 28, 2012 in a sealed container at 0.0°C.

The samples were received in a laminar flow clean hood, void of trace metals contamination and ultra-violet radiation, and were designated discrete sample identifiers. An aliquot of each sample was filtered (0.45µm) and each filtrate was stored in a secure, monitored cryofreezer (maintained at a temperature of -80^{o}C) until selenium speciation analysis could be performed via ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS).

2. Sample Preparation

All sample preparation is performed in laminar flow clean hoods known to be free from trace metals contamination. All applied water for dilutions and sample preservatives are monitored for contamination to account for any biases associated with the sample results.

Selenium Speciation Analysis by IC-ICP-CRC-MS Prior to analysis, an aliquot of each sample was filtered with a syringe filter (0.45µm) and injected directly into an autosampler vial. No further sample preparation was performed as any chemical alteration of a sample may shift the equilibrium of the system, resulting in changes in speciation ratios.

3. Sample Analysis

All sample analysis is preceded by a minimum of a five-point calibration curve spanning the entire concentration range of interest. Calibration curves are performed at the beginning of

each analytical day. All calibration curves, associated with each species of interest, are standardized by linear regression resulting in a response factor. All sample results are **instrument blank corrected** to account for any operational biases associated with the analytical platform.

Prior to sample analysis, all calibration curves are verified using second source standards which are identified as initial calibration verification standards (ICV).

Ongoing instrument performance is identified by the analysis of continuing calibration verification standards (CCV) and continuing calibration blanks (CCB) at a minimum interval of every ten analytical runs.

Selenium Speciation Analysis by IC-ICP-CRC-MS Each sample for selenium speciation analysis was analyzed by ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS) on December 29, 2012. An aliquot of each sample is injected onto an anion exchange column and mobilized by a basic (pH > 7) gradient. The eluting selenium species are then introduced into a radio frequency (RF) plasma where energy-transfer processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially-pumped vacuum interface and travel through a pressurized chamber (CRC) containing a reaction gas which preferentially reacts with interfering ions of the same target mass to charge ratios (m/z). A solid-state detector detects ions transmitted through the mass analyzer and the resulting current is processed by a data handling system.

Retention times for each eluting species are compared to known standards for species identification.

4. Analytical Issues

The overall analyses went well and no significant analytical issues were encountered. All quality control parameters associated with the samples were within acceptance limits.

The estimated method detection limits (eMDLs) for selenite, selenate, and selenocyanate are generated from replicate analyses of the lowest standard in the calibration curve. Not all selenium species are present in preparation blanks; therefore, eMDL calculations based on preparation blanks are artificially biased low.

The eMDL for methylseleninic acid and selenomethionine is calculated from the average eMDL of selenite, selenate, and selenocyanate. The calibration does not contain methylseleninic acid or selenomethionine due to impurities in these standards which would bias the results for other selenium species.

If you have any questions or concerns regarding this report, please feel free to contact me.

Sincerely,

Russell Gerads
Vice President
Applied Speciation and Consulting, LLC

Selenium Speciation Results for Duke Energy
Project Name: Belews Creek (Flex Fuel) - WW
Contact: Jay Perkins
LIMS #J12120342

Date: January 8, 2013
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Sample Results

Sample ID	Se(IV)	Se(VI)	SeCN	MeSe(IV)	SeMe	Unknown Se Species (n)
FGD Purge Eff	10.2	54.7	ND (<1.2)	2.0	ND (<1.8)	0.0 (0)
BioReactor 1 Inf	19.0	47.8	ND (<0.31)	1.50	ND (<0.44)	0.0 (0)
BioReactor 2 Inf	4.94	3.07	ND (<0.31)	ND (<0.44)	ND (<0.44)	0.0 (0)
BioReactor 2 Eff	ND (<0.44)	ND (<0.56)	ND (<0.31)	ND (<0.44)	ND (<0.44)	0.0 (0)

All results reflect the applied dilution and are reported in µg/L
ND = Not detected at the applied dilution
SeCN = Selenocyanate
MeSe(IV) = Methylseleninic acid
SeMe = Selenomethionine
Unknown Se Species = Total concentration of all unknown Se species observed by IC-ICP-MS

Selenium Speciation Results for Duke Energy
Project Name: Belews Creek (Flex Fuel) - WW
Contact: Jay Perkins
LIMS #J12120342

Date: January 8, 2013
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Quality Control Summary - Preparation Blank Summary

Analyte (µg/L)	PBW1	PBW2	PBW3	PBW4	Mean	StdDev	eMDL*	eMDL 250x	eMDL 1000x
Se(IV)	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.44	1.8
Se(VI)	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.56	2.3
SeCN	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.31	1.2
MeSe(IV)	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.44	1.8
SeMe	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.44	1.8

eMDL = Estimated Method Detection Limit
*Please see narrative regarding eMDL calculations

Quality Control Summary - Certified Reference Materials

Analyte (µg/L)	CRM	True Value	Result	Recovery
Se(IV)	LCS	9.57	9.64	100.7
Se(VI)	LCS	9.48	9.15	96.5
SeCN	LCS	8.92	8.84	99.1
MeSe(IV)	LCS	6.47	6.28	97.1
SeMe	LCS	9.32	9.08	97.4

Selenium Speciation Results for Duke Energy
Project Name: Belews Creek (Flex Fuel) - WW
Contact: Jay Perkins
LIMS #J12120342

Date: January 8, 2013
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Quality Control Summary - Matrix Duplicates

Analyte (µg/L)	Sample ID	Rep 1	Rep 2	Mean	RPD
Se(IV)	Batch QC	5.80	5.87	5.84	1.1
Se(VI)	Batch QC	12.77	12.70	12.74	0.5
SeCN	Batch QC	ND (<0.31)	ND (<0.31)	NC	NC
MeSe(IV)	Batch QC	ND (<0.44)	ND (<0.44)	NC	NC
SeMe	Batch QC	ND (<0.44)	ND (<0.44)	NC	NC

ND = Not detected at the applied dilution
NC = Value was not calculated due to one or more concentrations below the eMDL

Quality Control Summary - Matrix Spike/ Matrix Spike Duplicate

Analyte (µg/L)	Sample ID	Spike Conc	MS Result	Recovery	Spike Conc	MSD Result	Recovery	RPD
Se(IV)	Batch QC	1390	1311	93.9	1390	1304	93.4	0.5
Se(VI)	Batch QC	1261	1180	92.5	1261	1171	91.9	0.7
SeCN	Batch QC	1144	1057	92.4	1144	1050	91.8	0.7

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Pg 3 of 3

[19]Page 1 of 1

DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Duke Energy

Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-4349

Analytical Laboratory Use Only

LIMS # J12120342 | Matrix: OTHER | Samples Originating From | NC___ SC___

Logged By LB | Date & Time 12/27/12 0922 | SAMPLE PROGRAM ___ Drinking Water ___ Waste ___ Ground Water NPDES ___ UST RCRA

0.3 Cooler Temp (C)

AS&C
PO#133241

Brooks Rand
PO#141391

Customer must Complete

1)Project Name: Belews Creek (Flex Fuel) - WW		2)Phone No:
2) Client: Melonie Martin, Wayne Chapman, Tom Johnson, Bill Kennedy		4)Fax No:
5)Project: MBCFFLX01	6)Account:	Mail Code:
8)Oper. Unit: BC01	9)Process: NEXHSTK	10)Activity ID:

plete all appropriate non-shaded areas.

[15]Preserv.: 1=HCl, 2=H_2SO_4, 3=HNO_3, 4=Ice, 5=None

[16]Analyses Required

LAB USE ONLY [11]Lab ID	Se Speciation Bottle ID	[13]Sample Description or ID	Date	Time	Signature	[17]Comp.	[18]Grab	TDS, TSS (4)	Hg 1631 total and filtered V_Brand (4)	Metals + Hg 245.1* (3)	Mn (ICP), Se (IMS) filtered (3)	Se, Speciation, V_ASC (4)	Chloride, Sulfate, Bromide, - Dionex (4)
201202730 6		FGD Purge Eff	12-21	730	[signature]			1		1	1	1	1
201202730 7		EQ Tank		735						1	1		
201202730 8		BioReactor 1 Inf		740					1	1*	1	1	
201202730 9		BioReactor 1 Inf Hg Blk		740					1				
201202731 0		BioReactor 2 Inf		745					1	1*	1	1	
201202731 1		BioReactor 2 Inf Hg Blk		745					1				
201202731 2		BioReactor 2 Eff		750					1	1*	1	1	1
201202731 3		BioReactor 2 Eff Hg Blk		750					1				
201202731 4		Filter Blank		800							1		

Filter Mn and Se in the field

Lab, return kit to Tom Johnson LB 12/27/12

Customer to complete appropriate columns to right

Customer to sign & date below - fill out from left to right.

1) Relinquished By [signature]	Date/Time 12/26/12 1300	2) Accepted By COURIER	Date/Time 12/26/12
3) Relinquished By COURIER	Date/Time 12/27/12 0915	4) Accepted By [signature]	Date/Time 12/27/12 0915
5)Relinquished By	Date/Time	6)Accepted By:	Date/Time
7)Relinquished By [signature]	Date/Time 12/27/12 1300	8)Accepted By:	Date/Time
9)Seal/Locked By [signature]	Date/Time 12/27/12 1300	10) Seal/Lock Opened By [signature] Jacki Ford	Date/Time 12/28/12 1100
11)Seal/Locked By	Date/Time	12)Seal/Lock Opened By	Date/Time 0.0°C

Comments: * Metals=TRM/IMS = As, Cd, Cr, Cu, Ni, Se, Ag, Zn TRM/ICP = B, Ca, Fe, Mg, Mn * No Hg 245.1

Customer, IMPORTANT! Please indicate desired turnaround.

[22]Requested Turnaround

21 Days ____X____
*7 Days _____
*48 Hr _____
*Vendor Lab 13 Days ___X___

1-10-13

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-4349

Analytical Laboratory Use Only

LIMS # J12120342 | Matrix: OTHER | Samples Originating From | NC___ SC___
Logged By LB | Date & Time 12/27/12 0922 | SAMPLE PROGRAM ___ Ground Water ___ Drinking Water ___ NPDES ___ UST ___ RCRA ___ Waste ___
Vendor | 0.3 Cooler Temp (C)
Vendor: ASC, Brooks Rand
MR #

[19]Page 1 of 1
DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Customer must Complete

[1]Project Name	Belews Creek (Flex Fuel) - WW	[2]Phone No:	
[2] Client:	Melonie Martin, Wayne Chapman, Tom Johnson, Bill Kennedy	[4]Fax No:	
[5]Project:	MBCFFLX01	[6]Account:	Mail Code:
[8]Oper. Unit:	BC01	[9]Process: NEXHSTK	[10]Activity ID:

[15]Preserv.: 1=HCL, 2=H_2SO_4, 3=HNO_3, 4=Ice, 5=None

Customer to complete all appropriate non-shaded areas.

Customer to complete appropriate columns to right

LAB USE ONLY [11]Lab ID	Se Speciation Bottle ID	[13]Sample Description or ID	Date	Time	Signature	[17]Comp.	[18]Grab	[16]Analyses Required: TDS, TSS	Hg 1631 total and filtered V_Brand	Metals + Hg 245.1*	Mn (ICP), Se (IMS) filtered	Se, Speciation, V_ASC	Chloride, Sulfate, Bromide, - Dionex
201202730[illegible]		FGD Purge Eff	12-21	730				1		1	1	1	1
201202730[illegible]		EQ Tank		735						1	1		
201202730[illegible]		BioReactor 1 Inf		740					1	1*	1	1	
201202730[illegible]		BioReactor 1 Inf Hg Blk		740					1				
201202730[illegible]		BioReactor 2 Inf		745					1	1*	1	1	
201202730[illegible]		BioReactor 2 Inf Hg Blk		745					1				
201202731[illegible]		BioReactor 2 Eff		750					1	1*	1	1	1
201202731[illegible]		BioReactor 2 Eff Hg Blk		750					1				
201202731[illegible]		Filter Blank		800							1		

Filter Mn and Se in the field

Lab, return kit to Tom Johnson LB 12/27/12

Customer to sign & date below - fill out from left to right.

1) Relinquished By	Date/Time 12/26/12 1300	2) Accepted By COURIER	Date/Time 12/26/12
3) Relinquished By COURIER	Date/Time 12/27/12 0915	4) Accepted By LB Lewis	Date/Time 12/27/12 0915
5)Relinquished By	Date/Time	6)Accepted By:	Date/Time
7)Relinquished By	Date/Time	8)Accepted By:	Date/Time
9)Seal/Locked By	Date/Time	10) Seal/Lock Opened By	Date/Time
11)Seal/Locked By	Date/Time	12)Seal/Lock Opened By	Date/Time

Comments

* Metals=TRM/IMS = As, Cd, Cr, Cu, Ni, Se, Ag, Zn TRM/ICP = B, Ca, Fe, Mg, Mn * No Hg 245.1

Customer, IMPORTANT! Please indicate desired turnaround.

[22]Requested Turnaround

21 Days ___X___
*7 Days ___
*48 Hr ___
*Vendor Lab 13 Days ___X___